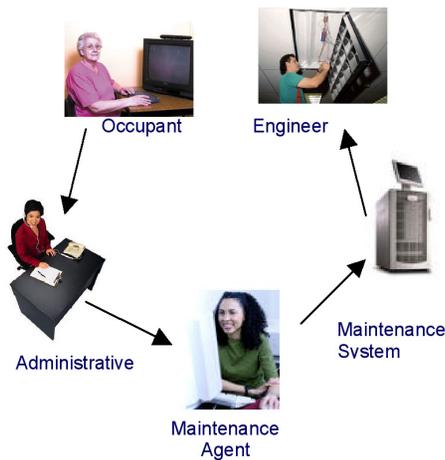


# TENANT INTERFACE FOR ENERGY AND MAINTENANCE SYSTEMS (TIEMS)

## Information Technology for Energy and Maintenance Management

Most building operators obtain corrective maintenance information (such as tenant complaints) through a lengthy process that provides no feedback to the tenant, as shown in Figure 1. Information may be dropped or not fully explained.

Figure 1. In most buildings, occupants never interface with operators and maintenance providers.



UC Berkeley researchers designed computer software (the Tenant Interface for Energy and Maintenance System, or TIEMS) to collect and manage information from tenants more efficiently (Figure 2). Tenants, like sensors, are sources that can provide real time environmental information. The challenge is to collect, archive, and analyze this information in a manner that enhances operator responsiveness and then act on it to improve building operations.

## What Does TIEMS Do?

TIEMS uses information technology to improve occupant satisfaction and building maintenance. User interfaces enable tenants to enter corrective maintenance complaints and view the status of their work environment—such as maintenance notices and environmental conditions. Information retrieval algorithms and artificial intelligence help maintenance engineers diagnose problems.

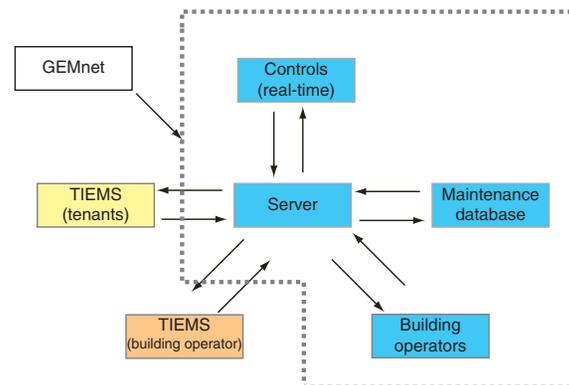
TIEMS allows tenants to:

- Submit service requests
- Check service request status
- Check indoor temperatures
- Check building maintenance activities.

TIEMS lets building operators:

- Set security permissions
- Manage service request
- Provide notices of maintenance activities
- Identify redundant service requests.

Fig 2. A schematic of the TIEMS system. Information is collected and distributed to tenants, operators, and control systems, and stored in archival databases.



## What are the Benefits?

Building operators can lower operational costs by:

- Managing service request activity
- Tracking time spent per service request/performance
- Enabling energy reduction efforts using maintenance notifications.

Occupant satisfaction is increased by:

- Complaint status feedback
- Maintenance activity notices.

TIEMS provides better information:

- Reduces steps required for action
- Less miscommunication, lost information, time verifying data
- Provides enforcement for more accurate data
- Establishes a common protocol between tenants and maintenance engineers.

Screen from the TIEMS program.

| Last 10 Service Requests  | Date Reported On | Status               |
|---|------------------|----------------------|
| There is no ventilation in the center cubicle area. There has not been any air circulation since the morning. (Location: Tucson Federal Building / FLR:02 / RM: Reported by: Luis Villafana on: 9/19/2002 2:04:48 PM) | 9/19/2002        | Waiting for Approval |
| The temperature is too hot in the 3rd floor kitchen area. (Location: Tucson Federal Building / FLR:03 / RM: Reported by: Luis Villafana on: 9/19/2002 2:03:34 PM)   | 9/19/2002        | Waiting for Approval |
| There is water leaking out of the men's bathroom on the 3rd floor. (Location: Tucson Federal Building / FLR:03 / RM: Reported by: Luis Villafana on: 9/19/2002 2:00:25 PM)  | 9/19/2002        | Waiting for Approval |

# INTERESTED?

# TIEMS

**Building owners and operators** can use TIEMS to lower operational costs.

**Building occupants** can use TIEMS to report on maintenance problems, and track the progress of their correction.

**Building maintenance engineers** can gain a better understanding of problem areas within their buildings.

Technical reports about TIEMS are available at:

[http://eetd.lbl.gov/btp/buildings/hpcbs/Element\\_5/02\\_E5\\_P2\\_2\\_4.html](http://eetd.lbl.gov/btp/buildings/hpcbs/Element_5/02_E5_P2_2_4.html)



This project is part of LBNL's High-Performance Commercial Building Systems program, a three-year public-private research initiative targeting substantial reductions in the energy costs of commercial buildings.

For access to all program results, see: <http://buildings.lbl.gov/hpcbs>



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### Contact information:

California Energy Commission  
<http://www.energy.ca.gov/pier/index.html>

Martha Brook  
[mbrook@energy.state.ca.us](mailto:mbrook@energy.state.ca.us)

Clifford Federspiel, Project Lead  
University of California, Berkeley  
[cliff\\_f@uclink4.berkeley.edu](mailto:cliff_f@uclink4.berkeley.edu)

Stephen Selkowitz, Program Coordinator  
LBNL  
[seselkowitz@lbl.gov](mailto:seselkowitz@lbl.gov)



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for Building Energy  
and Maintenance Management*

